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News Letter

Contents

■ A M7.0 Earthquake Hit Northern Japan on 26th May, 2003,

At 18:24 on 26th May, 2003, an earthquake with a magnitude of 7.0 on the JMA scale took place along the Pacific coast of northeast Japan. The focal depth was found to be 71 km. The city of Sendai and its northern area were violently shaken. Figure1 shows the peak horizontal acceleration on the ground observed by the seismograph network of the Ministry of Land, Infrastructure and Transport (MLIT). As shown in Figure1, peak ground acceleration exceeding 1G was recorded at three observation points. Although no fatal casualty was recorded, 172 people were injured and the total amount of damage is estimated to be \13.2 billion. The NILIM conducted a reconnaissance survey, jointly with three other public research institutes. Photo1 shows the flow slide of a gently banked slope with an inclination of 11 ° for a width of 50 m where the soil travelled 160 m. It is inferred that the volcanic ash soil was liquefied. While road bridges did not sustain any significant damage, the cover concrete of several tens of piers of the Shinkansen railway line was peeled off.

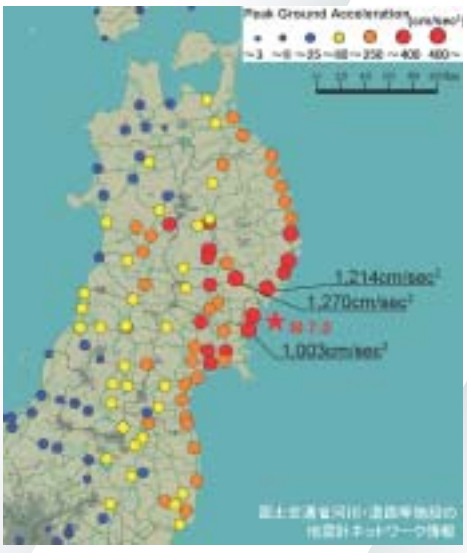

Figure 1 Distribution of the peak horizontal acceleration on the ground observed by the seismograph network of the MLIT

Photo 1 Large-scale flow slide of a banked slope

Port facilities did not sustain any functional damage. Nevertheless, a relatively large-scale phenomenon of liquefaction was observed in the Nonoda District of Port Ohfunato (Photo2). Traces of sand boil were observed from behind the open-type wharf on vertical piles and batter pile with sheet pile wall to some 60 m inland. The browed up sands in the inland area contained gravels as large as 5 cm in diameter. The earthquake caused subsidence of some 10-15 cm of the concrete paving at the cargo handling area. This figure represents approximately 1% of the entire thickness of reclaimed soil, which is deemed rather minor subsidence caused by liquefaction.

Damage to housing was relatively small; only two were totally destroyed and 21 were partially destroyed. Among

RC buildings, a municipal office building and a primary school building, etc.(see Photo3) sustained structural damage but other buildings sustained little damage. Steel framed gymnasiums suffered the rupture or buckling of its bracing members, buckling of the truss materials and damage to the anchor sections of the roof truss. In addition, damage possibly leading to the loss of the building functions and human casualties occurred, including the fall of exterior, interior and ceiling materials, damage to and the fall of smoke-proof glass, the fall of air-conditioning ducts and the fall of books.

Figure 2 shows the acceleration response spectra of the strong motion records. One of major characteristics of this earthquake is that the short period component of ground motion is dominant compared to the 1995 Hyogoken Nanbu earthquake. This characteristics is believed to be the major reason for the light damage despite the large peak ground acceleration.

Photo 3 Damage to the corridor wall of a primary school building

Photo 2 Deposit of silt erupted out behind a pier

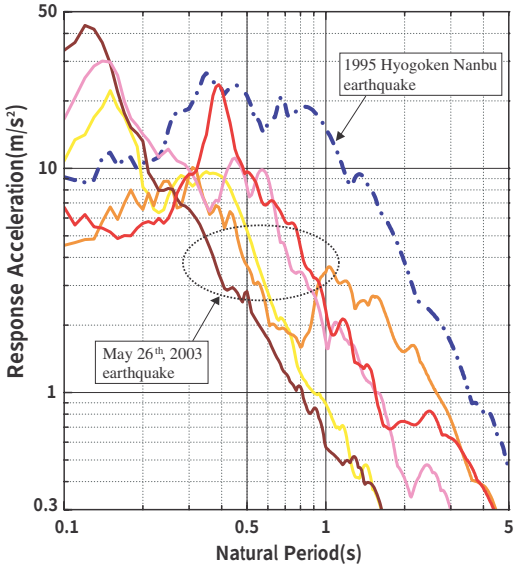

Figure 2 Acceleration response spectra (h = 5%)

Sixth Japan - Canada Housing R & D Workshop

The Sixth Japan - Canada Housing R & D Workshop was held on 4th (Wednesday) and 5th (Thursday) June, 2003 at the Tsukuba International Conference Center in Tsukuba (sponsored by the Building Research Institute, the National Institute for Land and Infrastructure Management, the Institute for Building Environment and Energy Conservation, the Natural Resources Canada, the National Research Council Canada, the Canada Mortgage and Housing Corporation and the Department of Foreign Affairs and International Trade).

More than 200 people participated in the Workshop, including 13 people from Canada, 56 people from Japanese building material manufacturers, 22 people from housing developers, 86 people from other industries in the private sector and 38 related people, including authors of Japanese guidelines and university academics.

The main component of the Workshop was explanation of "Guidelines to Avoid Moisture and Condensation Problems in Energy Efficient Building Envelopes" which had been prepared in advance by experts in Japan and Canada incorporating the latest information available in both countries to housing developers in order to respond to requests by these developers and to incorporate the progress of research. In addition, the themes of presented papers featured the latest information on energy saving measures in Japan and Canada as well as information on "sick house syndrome" which is a major point of concern for developers regarding the Building Standards Law revised in July, 2002.

The contents of these presentations are outlined below. Firstly, the latest information on energy saving measures was presented with a detailed explanation of the present situation of energy consumption in Japan and Canada, the target values based on the Kyoto Protocol for the two countries and the contents as well as future prospects of energy saving measures promoted by the two governments. The latest technologies were also introduced.

The next presentation was about the latest information on the control and ventilation of pollutants from building materials. The subjects explained were, among others, the current situation of the indoor air quality (IAQ) of housing, analysis of how pollutants from building materials are released to cause air pollution, ventilation system standards as a measure to deal with the problem of sick housing under the Building Standards Law and the Canadian approach to ventilation systems and the problem of indoor air pollution.

These presentations were followed by an explanation of the contents of the Guidelines. This explanation commenced with the basic issues regarding condensation and wide-ranging subjects were then discussed together with the structure of the Guidelines. These included damp-

proofing measures for building envelopes, design tools, evaluation of the condensation prevention performance and building envelopes design examples.

Finally, four researchers and those in actual business, including Mr. Yuzo Minami, a building technology critic, were invited as guest commentators to comment on the Guidelines and the laws and regulations surrounding buildings from their own specialist point of view, followed by an active Q & A session between them and the participants of the Workshop.

At the same time, display booths were set up in the lobby of the venue. These displays featured various materials and construction methods relating to building envelopes and ventilation systems, etc., including displays by the Canadian sponsors. During the breaks, many of the participants were seen to earnestly gather the various information on display.

Prior to the Workshop, a technical tour was organized to a housing construction site and other places. Moreover, a reception was held following the presentations on 4th June, attracting many of the participants who actively exchanged information between themselves while enjoying refreshments.

Photo 4 Technical tour to construction site

US - Japan Panel on Wind and Seismic Effects

The 35th Joint Meeting of the US-Japan Panel on Wind and Seismic Effects of the US-Japan Cooperative Program in Natural Resources (UJNR) was held on May 12th through 14th, 2003 at the National Institute for Land and Infrastructure Management (NILIM). Thirteen members of the NILIM, including Mr. Haruhiko Okuno, the Director General of the NILIM, participated in this Joint Meeting on the Japanese side together with many staff members who provided support for the Joint Meeting while 18 people, including Mr. H. S. Lew, Acting Chairman of the Panel, participated on the US side.

In seven technical sessions, 31 submitted papers (16 from Japan and 15 from the US) were actively discussed. The Panel had five task committees(T/Cs)to ensure closely-knit activities and the Resolutions for the 35th Joint Meeting approved the setting up of a new task committee on the subject of "advanced information and communication technology for disaster prevention and public health evaluation" to be jointly chaired by the NILIM, the Cabinet Office, and US-side chairs.

The Final Resolutions consist of 12 items, including approval of the new task committee. Other items include the strengthening of cooperative activities and the exploration of new ideas and areas based on the confirmed importance of the continued work of the Panel, approval of four T/C workshops, dissemination of the Panel's work to the rest of the world through the Internet and the plan to hold the 36th Joint Meeting in May, 2004 in the US to be hosted by the US side.

Photo 5 Participants of the 35th Joint Meeting of the US-Japan Panel on Wind and Seismic Effects, UJNR

Japan-Sweden Workshop, "Road Science and Technology"

On 2nd and 3rd June, 2003, the Third Japan-Sweden Workshop, "Road Science and Technology" was held in Lidingo, Sweden under the joint auspices of the two countries. The themes for this Workshop were "Road technology in snowy and cold regions" and "Road and transport management". More than 30 research scientists and engineers from the two countries participated, including, Mr.Okuno, Director General of the NILIM and representatives of the Road Bureau, the Hokkaido Regional Development Bureau, the Public Works Research Institute and the Civil Engineering Research Institute of Hokkaido on the Japanese side and Mr. Henriksson, Ambassador, Director of the International Secretariat of the Swedish National Road Administration and Dr. Karlström, Director of the Swedish National Road and Transport Research Institute on the Swedish side. The presentations were regarding road technologies in snowy and cold regions, and road and transport management in practical application, recent R&D topics and research results, and these were actively discussed by the participants.

The Third Workshop followed the path opened up by the First Workshop in December, 2000 which was based on Implementing arrangement concerning research cooperation in the field of road science and technology concluded between the NILIM and the Swedish National Road Administration in October, 1999.

In addition to the decision to hold the next workshop in Japan around May, 2005, further consultation on personnel exchanges was agreed by the two sides.

Photo 6 Participants of the Opening Ceremony of the Workshop
(courtesy of Mr. Johan Knutsson)

Earthquake Damages in Algeria

At 19:44 (local time) on 21st May, 2003, an earthquake measuring 6.8 on the Richter scale took place in Algeria and the epicenter was at the seabed some 7 km north of Zemmouri in the Boumerdes Prefecture. The maximum acceleration was approximately 580 gal observed in southern Boumerdes and considerable damage was caused in areas near the epicenter (Figure3 and Figure4).

After the earthquake and in response to a request made by the Algerian government, the Japanese government dispatched a team of experts to survey the damage in the disaster-hit areas for the evaluation of building safety and other matters (①～⑥ in Figure3). The Algiers and Boumerdes Prefecture were the worst hit. According to a survey conducted by the Algerian government, more than 2,200 people were killed and more than 12,000 people were injured. Some 100,000 people were forced to live in tents in the aftermath of the earthquake. While 12,000 buildings collapsed or were otherwise seriously damaged, such infrastructure as roads, railway lines and ports sustained much less damage.

Many of the damaged buildings were low to medium height with RC frame structures and unreinforced brick walls. The entire storeys of some buildings collapsed. In the case of those buildings which had fewer walls due to the use of the ground floor for a shop or garage, etc., the damage appears to have been concentrated on the ground floor in many cases. Some of these buildings actually fell over. The photo7 shows the completely collapsed section of a three storey RC classroom building on the south campus of Boumerdes University located at survey point ②.

Earnest efforts are required to rehouse those people living in tents toward permanent houses, to investigate the causes of the damage to buildings, to repair the damaged buildings and to introduce appropriate measures to prepare for an earthquake disaster in the future.

Figure 3 Map of damaged area and Survey points ①-⑥

Figure 4 Map of Algeria

Photo 7 Boumerdes University

TECHNICAL NOTE of National Institute for Land and Infrastructure Management (April-May, 2003)

No.	Title of Paper	Names of Divisions
64	FY2001 ANNUAL REPORT OF WATER QUALITY CONTROL DEPARTMENT	Water Quality Control Department
68	Researches on technology utilizing artificial satellites for urban green survey	Landscape and Ecology Division
70	Research on a Method of Estimating the Range of Debris Flow Damage to Buildings	Erosion and Sediment Control Division
71	SATURN-Seismic Assessment Tool for Urgent Response and Notification	Earthquake Disaster Prevention Division
78	Hydraulic Study on Accumulation of Drifting Wood at a Bridge During a Flood.	River Division
83	"The Standard about the Judgment of the Condominium which is in a Dangerous Situation for reasons of Security or Detrimental Situation for reasons of Sanitation "(Proposal) Based on the 1st Clause of the 102nd Article of Law for the Facilitation of Rebuilding of Condominium, and Related Data	Housing Planning Division
84	Manual for Consensus Formation about Rebuilding Condominium Manual for Judging Whether to Rebuild or to Repair/Improve Condominium	Housing Planning Division
86	Report of the Symposium about Condominium Rebuilding -How to Prepare for Condominium Rebuilding?-	Housing Planning Division
100	Application of High Strength Concrete in Airport Pavements	Airport Facilities Division
101	Numerical Simulations of Airport Pavement Structures Based on Three-dimensional Finite Elements	Airport Facilities Division
102	Applicability of Consistent Curing Method in Airport Concrete Pavement	Airport Facilities Division
103	The 11th Conference on Public Works Research and Development in Asia	Research Administration and International Cooperation Division

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